[54] **METHOD OF ALIGNING SHAPES ON A DISPLAY OF A COMPUTER SYSTEM**

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Related U.S. Application Data

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[57] **ABSTRACT**

An apparatus for recognizing shapes characterized by a stroke grouper receptive to a plurality of strokes formed on a screen of a pen-based computer system; a shape recognition engine receptive to a stroke group produced by the stroke grouper; and a knowledge base coupled to the shape recognition engine, where the knowledge base includes, at a minimum, knowledge concerning closed polygons and closed curves. Prefera-bly, the closed curves of the knowledge base include both circles and ellipses. A method for recognizing digitized shapes in a computer system includes the steps of receiving at least one user-initiated stroke; grouping the user-initiated stroke with related strokes to form a stroke group; and analyzing the stroke group to make a best-guess shape represented by the stroke group. Pref-erably, the method also looks for other shapes which are related to the best-guess shape and modifying at least one of the location, size, or shape of the best-guess shape to conform with the other shapes. The strokes are typically grouped when they are related in time, or space, or in both time and space. A method for recog-nizing and forming shapes includes the steps of: creating a live group including at least one live stroke; character-izing shape sides from the live group, where a shape side is either straight or curved; forming a polygon from the shape sides if all the shape sides are straight; forming an ellipse from the shape sides if all the shape sides are curved; and forming a composite curve from the shape sides if the shape sides are a mixture of straight sides and curved sides. The step of characterizing shape sides preferably includes the steps of: finding kinks in the live group; defining shape sides as segments between the kinks; and determining whether the shape sides are straight or curved.

6 Claims, 32 Drawing Sheets